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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/675,289	09/29/2003	William F. Micka	TUC920030045US1	5437

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EXAMINER	
TIMBLIN, ROBERT M	
ART UNIT	**PAPER NUMBER**
2167	

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	02/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No.	Applicant(s)	
	10/675,289	MICKA ET AL.	
	Examiner	Art Unit	
	Robert M. Timblin	2167	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 January 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-18* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action corresponds to application 10/675,289 and Applicant's remarks and amendments filed 1/18/2007.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/18/2007 has been entered.

Response to Amendment

The Examiner acknowledges and enters the amendments made to this application. Accordingly, claims 1-18 have been examined and are pending prosecution.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Beal et al. ("Beal" hereinafter) (US 5,155,845) in view of Tan et al. ("Tan" hereinafter) (US 2003/0126347 A1).

With respect to claims 1 7, and 13, Beal discloses A method to coordinate interconnected information storage and retrieval systems, wherein each of the information and storage systems is capable of communicating with one or more host computers, comprising the steps of:

'providing a host computer' (drawing 101).

providing a plurality information storage and retrieval systems (figure 1 shows at least two storage systems), wherein each of said plurality of information storage and retrieval systems is interconnected with each of the other information storage and retrieval systems (drawing reference 106, 110, 108) is interconnected with said host computer (drawing reference 101, 102, 104 and figures 1-2); and wherein each of said information storage and retrieval systems is interconnected with a different remote storage location' (col. 8 line 25-39; col. 14, line 21-38; figs. 1-4).

'providing a plurality of controllers (105, 107, 113 and 112), wherein two of said plurality of controllers are disposed in each of said plurality of information storage and retrieval systems (105 and 112 are both controllers in the same storage system).' A DASD subsystem comprises a plurality of data storage control units (DSC) (col. 2, lines 60-67). A single DSC can be connected to one or more disk controllers (col. 9, line 53-55).

Beal fails to explicitly describe designating one of said plurality of controllers as a master controller and the remaining controllers as target controllers; generating one or more master controller commands by said master controller; providing said one or more master controller

commands to each of said target controllers, wherein said one or more master controller commands cause said target controllers to adjust the flow of data into and out of each of said one or more information storage and retrieval systems.

Tan, however teaches designating one of said plurality of controllers (figure1) as a master controller (active controller; 0023) and the remaining controllers as target controllers (0029; identifying the standby controller as a target device, 0023);

generating one or more master controller commands by said master controller (as the commands disclosed in 0025, 0029 and 0032);

providing said one or more master controller commands to each of said target controllers, wherein said one or more master controller commands cause said target controllers to adjust the flow of data into and out of each of said one or more information storage and retrieval systems (0023, 0030 and 0032) discuss commands from the active controller to the standby controller).

In the same field of endeavor, (i.e. providing data redundancy), it would have been obvious to one of ordinary skill in the data processing art at the time of the present invention to combine the teachings of the cited references because the teachings of Tan would have given Beal's invention inter-controller communication to facilitate communication between the controllers. Such teachings would provide the benefit of an improved controller redundancy (Tan at paragraph 0010). Furthermore, although Beal's storage systems may include one or more controllers, there remains a need for improved communication between them for improved data redundancy.

The limitations of claims 7 and 13 have been rejected for the same reasons as this claim for being essentially similar to claim 1. Furthermore, With respect to claims 7 and 13, Beal

teaches wherein each of said plurality of information storage and retrieval systems comprises two controllers as 105 and 112 are both controllers in the same storage system.

With respect to claims 2, 8, and 14, Tan discloses 'one or more master controller commands causing each of said target controllers to stop accepting write operations from said one or more host computers' (0025 and 0029).

With respect to claims 3, 9, and 15, Tan discloses 'each of said target controllers to form one or more consistency groups' as maintaining consistency groups (0007).

With respect to claims 4, 10, and 16, Tan discloses 'causing each of said target controllers to stop providing data to said one or more remote storage locations' as initiating and terminating data transfers (0029).

With respect to claims 5, 11, and 17, Beal discloses 'providing a host computer policy command to said master controller' as a host specifying a multiple copy service (col. 3 line 10-13).

'providing at a first time by said master controller to each target controller one or more first master controller commands' as a sequence of commands (col. 19, lines 34-50).

'providing at a second time by said master controller to each target controller one or more second master controller commands' as a sequence of commands (col. 19, lines 34-50).

With respect to claims 6, 12, and 18, Beal discloses 'providing status information to said master controller by each target controller' as the host is notified of the completion of the execution of the write command (col. 3, lines 30-42).

Response to Arguments

Applicant's arguments filed 1/18/2007 have been fully considered but they are not persuasive.

The Applicant argues on pages8-11 of the remarks that neither Beal et al. nor Cochran et al. singly or in combination, teach or suggest a storage system comprising a plurality of information storage and retrieval systems, wherein each of the plurality of information storage and retrieval systems is interconnected with each of the other information storage and retrieval systems, wherein each of the plurality of information storage and retrieval systems is interconnected with the same host computer, wherein each of the information storage and retrieval systems is interconnected with a different remote storage location, and wherein each of the information storage and retrieval systems comprises two controllers. The Examiner respectfully disagrees for the same reasons as noted above in the 35 USC 103 rejection above and further specified below.

The Examiner submits that the Beal reference teaches these limitations. Specifically, Beal teaches:

a plurality information storage and retrieval systems (figure 1 shows at least two storage systems), wherein each of said plurality of information storage and retrieval systems is interconnected with each of the other information storage and retrieval systems (drawing reference 106, 110, 108) is interconnected with said host computer (drawing reference 101, 102,

104 and figures 1-2); and wherein each of said information storage and retrieval systems is interconnected with a different remote storage location' (col. 8 line 25-39; col. 14, line 21-38; figs. 1-4).

In Beal's system of providing improved data availability, 'providing a plurality of information storage and retrieval systems' is taught at least in figures 1-4. Therein DSC 107, disk controller 113, and the connected disk drives 111 are the equivalent makeup of a storage and retrieval system. As this is one system, DSC 105, disk controller 112 and the connected disk drives 109 make up a second storage and retrieval system. Therefore at least a plurality of search and retrieval systems is disclosed by Beal. See also see description of these figures starting in column 5 to column 8 wherein these storage systems are further described.

Beal teaches 'wherein each of said plurality of information storage and retrieval systems is interconnected with each of the other information storage and retrieval systems.' Specifically as seen in figures 1-4, Beal teaches the storage systems are interconnected by data links 106. Data links 106 connect the storage information and retrieval systems so that they are interconnected. Beal further teaches interconnectivity at least in the abstract, column 4 line 51-61 and col. 5 line 49-52.

Beal teaches 'each of said plurality of information storage and retrieval systems is interconnected with said host computer.' Specifically, for example, Beal teaches this limitation in figures 1-4. Therein host 101 (figure 1) is interconnected to the first and second storage system through DSC 105. Figure 2 teaches this limitation as it can be seen that both storage systems are interconnected to each other via data link 106 and both storage systems are interconnected to host 101 via channels 103 and data links 104.

Beal teaches 'wherein each of said information storage and retrieval systems is interconnected with a different remote storage location.' In figure 1, Beal teaches a plurality of information storage and retrieval system (i.e. DSC, disk controller and disk drives). The disk drives attached to their respective controller are termed a duplex pair comprising a local device and a remote device. Therefore it is construed that each storage and retrieval system is interconnected with both a local and remote device. With each storage and retrieval system having its own remote devices, they are in different remote storage locations.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Robert M. Timblin whose telephone number is 571-272-5627. The examiner can normally be reached on M-F 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Cottingham can be reached on 571-272-7079. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Robert M. Timblin

Patent Examiner AU-2167
1/30/2007

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PRIMARY EXAMINER